

WHAT IS CLAIMED IS:

1. An ink image producing machine comprising:
 - (a) imaging means, including at least one ink jet print head and an image receiving station for producing an ink image on a heated substrate;
 - (b) a substrate handling assembly including holding means for holding a supply of substrates, and transport feeding means for transporting and feeding substrates in a substrate direction towards said image receiving station;
 - (c) a first substrate heating assembly located upstream of said image receiving station for initially heating each substrate being fed and transported from said holding means; and
 - (d) a second substrate heating assembly located downstream of said first substrate heating assembly and upstream of said image receiving station, relative to said substrate feeding direction, for controllably re-heating said each substrate, initially heated by said first substrate heating assembly, to a desired ink image receiving temperature.
2. The ink image producing machine of claim 1, wherein said imaging means includes an intermediate imaging member for temporarily supporting and transferring said ink image onto the heated substrate of said image receiving station.
3. The ink image producing machine of claim 1, wherein said substrate handling assembly includes speed control means for moving said each substrate being fed at a first speed through said first heating assembly and at a second and different speed through said second heating assembly.
4. The ink image producing machine of claim 1, wherein said substrate handling assembly includes a substrate registration device mounted upstream of said image receiving station relative to said substrate feeding direction for registering a lead end of said each substrate.

5. The ink image producing machine of claim 1, wherein said first substrate heating assembly includes a continuous, full-width heating element having a first length equal to a width of said each substrate, said first length extending across a path of movement of said each substrate for heating an entire edge to edge width of said each substrate as it is moved through said first heating assembly.

6 The ink image producing machine of claim 1, wherein said second substrate heating assembly includes at least one heating element having a second length less than a width of said each substrate, said second length extending across only a portion of a path of movement of said each substrate for heating only a part of an edge to edge width of said each substrate as it is moved through said second heating assembly.

7. The ink image producing machine of claim 1, wherein said second substrate heating assembly includes temperature sensing and control means connected to said at least one heating element for sensing a temperature of each substrate and controlling a temperature of said second substrate heating assembly.

8. The ink image producing machine of claim 3, wherein said second and different speed is relatively higher than said first speed.

9. The ink image producing machine of claim 3, wherein said first speed is calculated and controlled as a function of a predetermined dwell time for said each substrate through said first substrate heating assembly.

10. The ink image producing machine of claim 3, wherein said second and different speed is calculated and controlled as a function of a difference between an actual temperature of said each substrate coming from said first heating assembly and a predetermined image receiving temperature.

11. The ink image producing machine of claim 4, wherein said substrate registration device is located downstream of said second substrate heating assembly for heating said each substrate during registration thereof.

12. The ink image producing machine of claim 6, wherein said second heating assembly includes two said at least one heating element spaced from one another in a cross direction to said path of substrate movement.

13. A multi-stage pre-transfer substrate heating assembly in an image producing machine for heating a substrates and adjusting a temperature of such substrate prior to image transfer, the multi-stage pre-transfer substrate heating assembly comprising:

- (a) a first substrate heating assembly located upstream of an image transfer and receiving station within the machine for initially heating each substrate being fed to said image transfer and receiving station; and

- (b) a second substrate heating assembly located downstream of said first substrate heating assembly relative to a substrate feeding direction for controllably re-heating said each substrate, initially heated by said first substrate heating assembly, to a desired image receiving temperature.

14. The multi-stage pre-transfer substrate heating assembly of claim 13, wherein said first substrate heating assembly comprises a plate having a first surface, a second and opposite surface, and a heating element.

15. The multi-stage pre-transfer substrate heating assembly claim 14, wherein said plate is made of a thermally conductive material.

16. The multi-stage pre-transfer substrate heating assembly of claim 14, wherein said plate is made of aluminum.